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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,023	12/20/2005	Rainer Hainberger	03-51059	1302

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Fujitsu Patent Center
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EXAMINER	
TRAN, DZUNG D	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,023	HAINBERGER ET AL.	
	Examiner	Art Unit	
	Dzung D. Tran	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,10,13-23,25,27 and 29* is/are rejected.

7)☒ Claim(s) *8-9,11-12 24,26,28 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The finality of the previous Office action is hereby withdrawn because the priority date of the present application is the filling date of June 30, 2003 of the PCT application that earlier than the US filling date of December 23, 2004 of Uda et al..

Specification

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7, 10, 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajiya et al. US 2003/0137721 in view of Pirio et al. (US Patent No. 5,532,861) and further in view of Tsuda et al. US Patent no. 6,038,063.

Regarding claim 1, Kajiya teaches in Figure 10, a method/apparatus of an optical regenerator comprising:

an optical amplifier 3-1 at an input of the regenerator of Figure 10;

an adjusting device 4 to receive the optical signal after the optical amplifier, adjust the optical output power to a level of launch power from the regenerator and output an adjusted optical signal;

a first monitoring device 5-1 to monitor the optical signal after the optical amplifier and output a first monitoring signal;

a second monitoring device 5-2 to monitor an optical signal after the adjusting device and output a second monitoring signal; and

control unit 24-1 and 6 for receiving the first and second monitoring signals respectively and control the optical amplifier based on the first monitoring signal and the adjusting device based on the second monitoring signal.

Kajiya differs from claim 1 of the present invention in that he does not teach an all-optical nonlinear device to provide a nonlinear transfer function between optical input power of an optical signal after the optical amplifier and optical output power of an optical signal after the nonlinear device and one control unit for controlling the amplifier and the attenuator.

Pirio discloses in Figures 7A, 7B, a regenerator having an optical amplifier 72 at an input of the regenerator 71 and an all-optical nonlinear device 5 connect to the amplifier 72.

At the time of the invention was made, it would have been obvious to an artisan to replace the amplifier 3-1 of Kajiya with the regeneration in Figures 7A, 7B having an optical amplifier 72 at an input of the regenerator 71 and an all-optical nonlinear device 5 connect to the amplifier 72 taught by Pirio in the system of Kajiya. One of ordinary skill in the art would have been motivated to do that in order to compensate the non-linear effect distortion. Furthermore, using one control unit for controlling both the

amplifier and the attenuator instead of using two control units is well known in the art as shown in Figure 13 of Tsuda.

Regarding claim 2, Kajiya discloses a first optical coupler to tap a part of the optical signal after the optical amplifier to provide the first monitoring device with the tapped optical signal; and a second optical coupler to tap a part of the optical signal after the adjusting device to provide the second monitoring device with the tapped optical signal (see Figure 10).

Regarding claim 3, Kajiya discloses wherein the adjusting device includes an optical amplifier 3-2.

Regarding claim 4, Kajiya discloses wherein the adjusting device includes a variable attenuator 4.

Regarding claim 5, Tsuda discloses, wherein the control unit 60 communicates with one of another optical regenerator and a receiver via an optical supervisory channel (Figure 13).

Regarding claim 6, Kajiya discloses the first monitoring device 5-1 wherein the monitoring device is well known to have a photodiode to measure the optical input power of the optical signal after the optical amplifier.

Regarding claim 7, the combination of Kajiya, Pirio and Tsuda discloses an optical fiber transmission system comprising an optical transmitter, an optical receiver, an optical fiber to connect the transmitter with the receiver, a plurality of optical

amplifiers along the optical fiber to compensate absorption losses of a signal light passing through the optical fiber, and at least one optical regenerator according to claim 6, wherein the control unit controls the optical amplifier using a signal from the photodiode to adjust an optical input power to the nonlinear device to a preset value (see Figure 1 of Tsuda).

Regarding claim13, Kajiya discloses wherein the first monitoring device includes a signal quality monitor to monitor a signal quality of the optical signal after the optical amplifier (paragraph 0096).

Regarding claim16, Kajiya discloses wherein the second monitoring device includes a signal quality monitor to monitor a signal quality of the optical signal after the adjusting device (paragraph 0096).

Regarding claims 10, 14-15 and 17-20, the combination of Kajiya, Pirio and Tsuda discloses wherein the control unit controls the optical amplifier 3-1 to adjust an optical input power to the nonlinear device using a feedback signal from the signal quality monitor and via the optical supervisory channel (paragraph 0096 of Kajiya and Figure 13 of Tsuda).

Regarding claim 21, Pirio discloses in Figures 7A, 7B, a monitoring device 73 to monitor the optical signal between the optical amplifier 72 and the nonlinear device 5 and output a monitoring signal.

Regarding claim 22, Pirio discloses in Figures 7A, 7B, an all-optical nonlinear device 5 connect to the amplifier 72.

8. Claims 23, 25, 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajiya et al. US 2003/0137721 in view of Pirio et al. (US Patent No. 5,532,861), Tsuda et al. US Patent no. 6,038,063 and further in view of Bonthron et al. (US Patent No. 6,738,173),referred herein as Bonthron.

Regarding claims 23 and 27, the combination Kajiya, Pirio and Tsuda teaches the limitations of claim 22. However, the combination Kajiya, Pirio and Tsuda does not teach wherein a target value of the optical input power of the optical signal is preset at a time of installation of the regenerator in an optical fiber transmission system, by adjusting the optical input power such that a bit error rate at a receiver in the optical fiber transmission system is minimized and storing an adjusted value as the target value. It is well-known in the art to use a minimum bit error rate as the criteria for choosing the operating parameters of a regeneration system. For example, Bonthron teaches providing a minimal bit error rate in a system with a regenerator (column 1, lines 53-67 and column 2, lines 1-5 teach minimizing the bit error rate in a system that includes regenerators). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to implement the teaching of the minimal bit error rate of Bonthron for the predictable result of minimizing the errors at the receiver, where the final data is read.

Regarding claims 25 and 29, Kajiya, Pirio and Tsuda teaches the limitations of claim 22. However, combination Kajiya, Pirio and Tsuda does not teach a method wherein a target value of the optical input power of the optical signal is preset at a time

of installation of the regenerator in an optical fiber transmission system, by adjusting the optical input power such that a bit error rate before a nonlinear device in a subsequent regenerator or at a receiver in case of the last regenerator in the optical fiber transmission system is minimized and storing an adjusted value as the target value. Bonthron teaches providing a minimal bit error rate in a system with a regenerator (column 1, lines 53-67 and column 2, lines 1-5 teach minimizing the bit error rate in a system that includes regenerators). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to implement the minimal bit error rate of Bonthron in the system of Kajiya, Pirio and Tsuda for the predictable result of minimizing the errors at the receiver, where the final data is read.

4. Claims 8-9, 11-12, 24, 26, 28 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung D Tran whose telephone number is (571) 272-3025. The examiner can normally be reached on 9:00 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from thePatent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.
Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dzung Tran

08/15/2009

/Dzung D Tran/

Primary Examiner, Art Unit 2613